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## **Implicit Measures of Attitudes and Political Voting Behavior**

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### **Abstract**

Implicit measures have contributed to the prediction of behavior in numerous domains including the political realm. Some theoretical arguments suggest that implicit measures are unlikely to substantially improve the prediction of political voting behavior. Other arguments are more optimistic, especially regarding the prediction of undecided voters' behavior. Here, we review the evidence regarding the extent to which implicit measures improve the prediction of political voting behavior beyond explicit self-report measures. Results reveal that implicit measures are often statistically significant predictors. However, the inclusion of an implicit measure leads to modest or even no improvement of the overall accuracy of the original prediction. We conclude that implicit measures are likely to be practically relevant for predicting voting behavior only if researchers can identify new approaches. Related findings in political psychology may pave the way as they demonstrate that implicit measures can contribute unique knowledge not accounted for in other ways.

### **Implicit Measures of Attitudes and Political Voting Behavior**

The prediction of political voting behavior is a key task for social scientists and pollsters. Even nowadays, the predictions of results of major political elections in affluent countries that are based on the best available algorithms are sometimes considerably off the mark (Nardelli, 2014; Silver, 2014; Ulmer, 2015). In recent years, (social) psychologists have investigated the extent to which implicit measures of attitudes and stereotypes can contribute to the prediction of political voting behavior beyond corresponding explicit self-report measures or voting intention. The present article provides an overview of the available evidence speaking to this question.

#### *Implicit social cognition and political behavior*

Implicit social cognition research investigates psychological processes in social contexts with a focus on automatic processes (Gawronski & Payne, 2010). In an attempt to capture such processes, researchers have developed a host of so-called implicit measures intended to shed light on constructs such as implicit attitudes or stereotypes (Fazio & Olson, 2003; Nosek, Hawkins, & Frazier, 2011). Among the most prominent of these measures are the implicit association test (IAT; Greenwald, McGhee, & Schwartz, 1998), the affect misattribution procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005), and the evaluative priming task (Fazio, Jackson, Dunton, & Williams, 1995). Interest in implicit measures has also been fueled by the increasing prominence of dual-process and dual-system models, which propose that human behavior is always a blend of controlled (often conscious) processes and automatic (often unconscious) processes (Sherman, Gawronski, & Trope, 2014). Implicit measures are believed to be helpful in elucidating unconscious, automatic processes. In many investigations, they have predicted a

broad variety of social behaviors such as interracial behavior, consumer behavior, alcohol and drug use, and political behavior, including political voting (for meta-analyses, see Cameron, Brown-Iannuzzi, & Payne, 2012; Greenwald, Poehlman, Uhlmann, & Banaji, 2009a; Rooke, Hine, & Thorsteinsson, 2008).

Despite the broad evidence for the predictive validity of implicit measures across a number of domains, researchers have also raised concerns about their usefulness to improve the prediction of political voting behavior (Gawronski, Galdi, & Arcuri, 2015; Nosek, Graham, & Hawkins, 2010). In fact, a theoretical analysis suggests that the prediction of political voting behavior is unlikely to profit much from the inclusion of an implicit measure.

Such an analysis encompasses at least the following observations: First, dual process theories such as the MODE model (Fazio, 1990; Fazio & Olson, 2014) or the reflective–impulsive model (Strack & Deutsch, 2004) propose that the processes assessed by implicit measures are unlikely to substantially influence behaviors that individuals can easily control and that they are motivated to control (for an overview, see Sherman et al., 2014). In line with this assumption, evidence suggests that implicit measures improve the prediction of behavior beyond parallel explicit measures particularly well for impulsive behaviors. These are behaviors that people do not control effectively because they situationally or dispositionally lack the ability or the motivation to do so, or because the behavior is inherently difficult to control (e.g., nonverbal behavior). In contrast, the incremental predictive value of implicit measures is often lower for deliberate, controlled behaviors (for overviews, see Fries, Hofmann, & Schmitt, 2008; Perugini, Richetin, & Zogmaister, 2010). Now, political voting is a decisively deliberate, intentional, conscious, and controllable behavior performed without any obvious situational constraints that would limit its controllability. In addition, it includes clear choice options that are known weeks and months before the election occurs.

Second, meta-analytic evidence suggests that implicit measures excel when they capture thoughts and feelings people are unwilling or unable to report (e.g., in the domain of intergroup stereotypes and discrimination; Greenwald et al., 2009a). However, in the domain of political voting, the vast majority of people are usually quite apt to report on their preferences (Nosek et al., 2010), except perhaps for supporters of political parties or candidates considered too socially disrespected or extreme.

Third, when two measures overlap to a great extent, it becomes increasingly difficult for one measure to substantially predict a criterion behavior over the other. Research on moderators of the relationship between explicit self-report measures and parallel implicit measures shows that political preferences meet several criteria for high implicit–explicit correlations: self-presentational demands are low, political preferences are usually well elaborated, and many topics have a bipolar structure (e.g., attitudes toward candidate A versus candidate B; see Nosek, 2005). Indeed, implicit–explicit correlations in the political domain are usually among the highest obtained for a large variety of domains. For example, they range around  $r \approx 0.60$ – $0.70$  for attitudes toward Democrats versus Republicans, Al Gore versus George Bush, or John Kerry versus George Bush (Nosek, 2005; Nosek & Hansen, 2008). Meta-analytic evidence suggests that the IAT predicts political behavior better than behavior from any of eight other investigated behavioral domains ( $r = 0.48$  as compared to the average of  $r = 0.27$  of all nine investigated behavioral domains including, for example, intergroup behavior, consumer preferences, or close relationships). However, predictive value in the political domain is drastically reduced to approximately  $r = 0.15$  when explicitly measured attitudes were controlled for (incremental validity; Greenwald et al., 2009a).

All of these arguments would seem to limit the potential of implicit measures to improve predictions of political voting behavior over and above explicit measures. They suggest that

focusing on political behavior “is perhaps the toughest test for the claim that implicit cognition can make novel additions to predicting social behavior” (Nosek et al., 2010, p. 548).

If the literature is apparently so clear that implicit measures cannot be of much use in predicting political voting behavior, why would researchers have embraced this idea at all? There are at least two theory-driven answers to this question. A first answer is: No behavior is process-pure (Sherman et al., 2014; see also Glaser & Finn, 2013). Dual-process theories suggest that any behavior is a blend of controlled and automatic processes, and their relative importance varies as a function of situational, dispositional, and behavioral boundary conditions. To estimate the potential use of implicit measures to predict political voting behavior, one crucial question is thus to what extent political voting decisions are in fact influenced by automatic processes. Another crucial question is how well these automatic processes can be captured by explicit self-report measures. After all, explicit self-report measures are also not process-pure. They are predominantly influenced by controlled processes, but to a lesser extent also by automatic processes (Sherman, 2009). If political voting decisions are influenced by automatic processes that are inadequately measured by explicit measures, then implicit measures may contribute meaningfully to behavioral predictions.

The second answer to the question of why implicit measures may be useful in predicting political voting behavior comes from one dual-process model in particular, the MODE model (Fazio, 1990; Fazio & Olson, 2014). The model postulates that attitudes can influence behavior through two different routes. On the deliberate route, attitudes guide behavior (e.g., voting) by serving as a basis to evaluate the available behavioral options (e.g., voting for candidate A or B), including the desirability and probability of their consequences. On the spontaneous route, attitudes may affect the perception of the current situation. That is, attitudes may bias information processing that later predisposes people to act in line with their pre-existing, but potentially difficult-to-access attitudes. Some evidence suggests that implicit measures may provide insights into such biased information processing particularly for individuals who report being undecided on explicit measures (see Gawronski et al., 2015, for an elaboration on this argument).

The discussion up to this point has made clear that there are good arguments to both doubt and be optimistic about the usefulness of implicit measures to contribute to the prediction of political voting behavior. In the following, we will review the existing evidence in light of these conflicting viewpoints. We will structure the review along two major research questions that have been pursued in the literature. One asks whether implicit attitude measures generally predict political voting behavior beyond explicit measures. The second question pertains to the more specific idea of whether implicit attitude measures predict political voting particularly for undecided voters. In a brief excursus, we will also review the evidence for implicitly measured race attitudes to predict voting behavior.

When evaluating the evidence, we will discuss two different indicators of implicit measures' value for the prediction. One is statistical significance in regression analyses beyond explicit measures. Statistical significance strongly depends on sample size with even tiny effects becoming statistically significant with increasing sample sizes. The other indicator is the increase in correctly classified voters beyond explicit measures. In the present context, the percentage of correctly classified cases is the proportion of voters for which the statistical model correctly predicts their voting behavior. That is, this criterion is concerned with matches between what the statistical model predicted a particular voter to do (e.g., to vote for candidate A or B) and what this voter eventually did (to vote for candidate A or B). Ultimately, the quality of a prediction model is reflected in this percentage of correctly classified cases (%CCC) and the value of an implicit measure is reflected by the increment in %CCC beyond explicit measures.

*Do implicit measures of attitudes predict voting behavior beyond explicit measures?*

Resting on the assumption that even largely deliberate behaviors such as political voting are partially influenced by automatic processes, researchers have sought to demonstrate incremental value of implicit measures of attitudes beyond explicit measures. This corresponds to an understanding of additive predictive validity of implicit and explicit measures (Perugini et al., 2010).

The very first published studies on the prediction of political voting behavior by implicit attitude measures were run in the context of the 2001 general elections and the 2005 local elections in Italy (Arcuri, Castelli, Galdi, Zogmaister, & Amadori, 2008). In both cases, participants completed an IAT relating to the major political coalitions or candidates, respectively, approximately one month prior to the elections. Samples included both voters who reported at that time being decided and undecided about who to vote for (Study 1,  $N_{\text{total}} = 52$ ) and only undecided voters (Study 2,  $N = 37$ ). In both studies, the IAT was a significant predictor of voting behavior. However, explicit attitude measures were not included. Thus, these studies cannot speak to the questions of whether and to what extent implicit attitude measures may be suited to improve the prediction beyond explicit measures.

A subsequent study investigated voting intentions in the 2000 U.S. presidential election race between George W. Bush and Al Gore using 167 undergraduate students and a cross-sectional design (Karpinski, Steinman, & Hilton, 2005). An IAT significantly predicted voting intentions, but when party identification or parallel explicit measures were additionally entered into the model, the IAT did not significantly contribute to the prediction. Similar results were obtained in a study conducted between three weeks and one week prior to the 2008 parliamentary election in Serbia (Pavlovic & Zezelj, 2013,  $N=143$ ). A compound score of several Brief IATs (BIAT; Sriram & Greenwald, 2009, see also Frieze & Fiedler, 2010) did not predict voting intention beyond an explicit measure and did not predict actual voting behavior, even without controlling for the explicit measure.

Two further studies used simulated voting decisions as the dependent variable in a hypothetical U.S. presidential election between Hillary Clinton and Jeb Bush (Lundberg, 2015,  $N \approx 530$  each). At the time of data collection (January/February 2015), Clinton and Bush were leading candidates of their respective parties in the run-up to the 2016 presidential election. The simulated vote was assessed one week after the attitude measures. In both studies, the AMP did not predict significantly beyond the explicit measure and did not increase the %CCC (no change in Study 1, a 0.2 percentage point decrease in Study 2). Note that in these studies, several other (non-significant) predictors were included that competed for predictive value in the model.

Several studies improved on these findings in that they consistently collected implicit and explicit attitude measures, actual (albeit self-reported) voting behavior, and larger samples. One study in the context of the 2002 German parliamentary election investigated attitudes toward the five major political parties with five Single Category IATs (SC-IAT; Karpinski & Steinman, 2006; see also Bluemke & Frieze, 2008) and five single-item Likert scales (Frieze, Bluemke, & Wänke, 2007). Explicit and implicit attitude measures were collected online up to three months before the election. Voting behavior data was collected in a follow-up session within two weeks after the election ( $N > 1500$ ). In each case, the SC-IATs were highly significant predictors of the decision to vote or not vote for a given party beyond the explicit measures. This speaks to the ability of implicit measures to predict voting behavior at least beyond a parallel single-item explicit measure. However, the same logistic regression models showed that, despite statistical significance, the implicit measures effectively did not improve the predictive quality of the models at the level of correctly classified voters (%CCC). For two of the five parties, the %CCC did not change at all. In one case, it increased by 0.1

percentage points; in two cases, it actually *decreased* by -0.1 and -0.3 percentage points, respectively. A similar pattern of results emerged for the SC-IATs predicting beyond a measure of voting intention, which was the strongest single predictor of actual voting behavior.

The latter results were corroborated by a study employing a large representative sample of the Italian electorate in the run-up to the 2006 Italian national election (Roccato & Zogmaister, 2010,  $N \approx 900$  in the final sample). Attitude measures and voting intention were collected about a month before the election in face-to-face computer-assisted interviews, and voting behavior was assessed just after the election. An IAT contrasted the left-wing with the right-wing coalition. In a logistic regression analysis, the IAT was a significant predictor beyond voting intention and the parallel explicit measure. However, again, the inclusion of the IAT hardly improved the quality of the overall prediction (+0.1%CCC). Similar results were found in the 2004 European Election in Italy (+1.1%CCC) and the 2005 General Election in England (no change in%CCC; Di Conza, Gnisci, Perugini, & Senese, 2010).

*Interim summary.* Several studies found statistically significant contributions of implicit attitude measures beyond explicit measures in the prediction of political voting behavior. In terms of correctly predicted voting decisions, implicit measures either did not improve the overall quality of the models or improved it only modestly.

*Do implicit measures of attitudes predict voting behavior particularly for undecided voters?*

Political voting is a very deliberate behavior. Despite considering that no behavior is process-pure, it may be comprehensible that overall implicit attitude measures do not seem to appreciably improve the prediction beyond explicit measures. However, there may be conditions or subsamples of individuals for whom explicit measures fare much worse. Implicit measures may then fill the gap and gain predictive value.

Several researchers – including the present authors – have entertained the idea that implicit measures may be particularly suited to predict the voting behavior of undecided voters. Arcuri et al. (2008) suggested that in the absence of a clear voting intention (i.e., when being undecided), explicit measures may not be predictive of subsequent voting behavior. However, people may harbor ‘embryonic preferences’ that may not be consciously accessible, but nevertheless predispose them to vote for a particular candidate or party. Implicit measures may access these otherwise inaccessible preferences and predict undecided voters’ behavior. This resonates with work on implicit–explicit consistency that reveals that consistency is lower under conditions of reduced awareness, which may increase the variance that implicit measures may account for in voting behavior (Hofmann, Gschwendner, Nosek, & Schmitt, 2005). Alternatively, an individual may feel that previous deliberations about a voting decision did not lead to a clear voting intention and thus partly give up the motivation to fully control the behavior, deciding instead to trust an impulsive gut feeling. To the extent a voter does so, voting behavior would become less deliberate and more impulsive.

Building on these ideas, subsequent work predicted a full double dissociation pattern (Galdi, Arcuri, & Gawronski, 2008; Gawronski & Galdi, 2011): (1) Implicit attitude measures were expected to predict voting behavior of undecided voters better than explicit measures, whereas (2) explicit measures were expected to predict voting behavior of decided voters better than implicit measures. This also implies that (3) implicit measures should predict voting behavior better for undecided than decided voters, whereas (4) explicit measures should predict voting behavior better for decided than undecided voters.

If supported, these hypotheses would have considerable practical implications. After all, predicting the voting behavior of undecided voters has been an unsolved challenge for pollsters for many years (Visser, Krosnick, Marquette, & Curtin, 2000). A sizable fraction of the

electorate typically reports being undecided weeks or even days before an election (CNN, 2012; Perry, 1979; Statista, 2014). Given the close races in many elections, being able to correctly predict the voting behavior of undecided voters would allow for clear-cut predictions in cases where otherwise only predictions with wide margins of error are possible.

What is the evidence for these hypotheses? In a seminal study, Galdi et al. (2008) asked residents of a northern Italian city about their opinions on the enlargement of a U.S. military base at the gates of the city (in favor of, undecided about, or against the enlargement). There were 96 decided and 33 undecided participants. The authors measured attitudes toward the enlargement implicitly (SC-IAT) and explicitly and then did so again one week later. The results revealed that the opinions of participants at time 2 who reported being decided at time 1 were well-predicted by the explicit, but not the implicit, measure. Strikingly, this relation was descriptively reversed for undecided participants: The implicit, but not the explicit, measure significantly predicted future opinions. In multiple regression analyses, the association between the implicit measure and opinions at time 2 was significantly stronger in undecided than in decided participants. Contrary to expectations, the association of the explicit measure with opinions at time 2 was not significantly different for decided and undecided participants.

This study had a strong impact in the scientific literature and the popular media. A new tool emanating from psychological science was apparently suited to predict future behavior that the respective individuals were themselves unable to predict. Despite this evidence, there was also need for replication and extension of this work to actual political voting behavior. In the study by Galdi et al. (2008), *opinions on the issue*, but no voting behavior or voting intentions were assessed. Also, remember that implicit–explicit consistencies in the political domain are usually high, because political cognitions are well elaborated, have clear and opposing positions, and are socially acceptable to share publicly. To replicate the pattern obtained by Galdi et al. (2008), these general conditions would have to be strongly reversed for undecided voters, because implicit measures can only predict so much better than explicit measures when explicit measures do not predict very well (e.g., because people may lack conscious access to their attitudes) and the overlap between implicit and explicit measures is negligible.

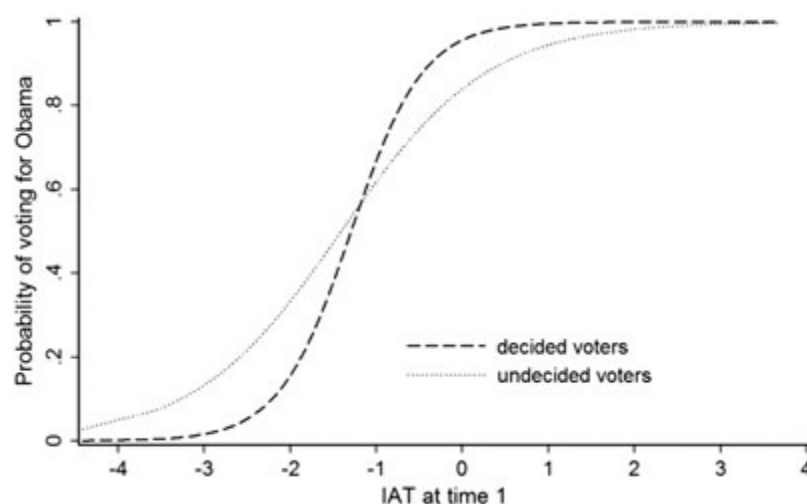
Several studies sought evidence for the predictive value of implicit measures for undecided voters in the context of *actual political voting behavior*. None of them found the predicted pattern of results that Galdi et al. (2008) found for the prediction of opinions. In a study reported earlier (Arcuri et al., 2008), no explicit measures were included, but descriptively, the IAT predicted voting behavior better for decided, not undecided voters. When looking at the incremental contribution of the implicit over the explicit attitude measure in the study by Roccato and Zogmaister (2010) discussed in the previous section, the implicit measure was significant for both decided ( $N = 669$ ) and undecided ( $N = 235$ ) voters, but the explicit measure was a stronger predictor of voting behavior than the implicit measure for both decided and undecided voters. The implicit measure increased the %CCC by +0.7 and +0.6 percentage points, respectively (M. Roccato, personal communication, October 1, 2015).

Several studies sought to specifically test the predicted double dissociation pattern. One study in the context of the 2008 U.S. presidential election between John McCain and Barack Obama measured attitudes toward the candidates implicitly (IAT) and explicitly (feeling thermometers) with measurements beginning 3.5 months prior to the election and continuing up until two weeks before the election (Friese, Smith, Plischke, Bluemke, & Nosek, 2012, Study 1). The IAT was a highly significant predictor of voting behavior over the explicit measure for both decided ( $N = 3291$ ) and undecided ( $N = 303$ ) voters, but this statistically significant effect led to zero change in the %CCC for undecided voters and +0.1 percentage points for decided voters. The explicit measure was a much better predictor of voting behavior than the implicit measure for both decided and undecided voters. Further analyses revealed that the IAT was a

better predictor of voting behavior for *decided* as compared to undecided voters (see Figure 1). The explicit measure strongly correlated with voting behavior for both decided and undecided voters ( $r_{\text{decided}} = 0.81$  and  $r_{\text{undecided}} = 0.59$ ), leading to 98.3 and 82.2 %CCC for decided and undecided voters, respectively, based on the single-item explicit measure alone. While the latter data speak to the strong predictive value of the explicit measure, they also suggest that there was ample unexplained variance available to the implicit measure for undecided voters.

Similar results emerged in a second study in the context of the 2009 German parliamentary election. A political camps and a political candidates IAT were significant predictors of voting behavior beyond parallel explicit measures for decided voters ( $N = 408/410$ , changes in %CCC by -0.5 and +1.0 percentage points, respectively) and undecided voters ( $N = 202/210$ , changes in %CCC by +1.0 and +2.8 percentage points, respectively). After entering a second explicit attitude indicator based on political party evaluations all IAT effects turned non-significant. Similar to the first study, the explicit measure strongly correlated with voting behavior for both decided and undecided voters ( $r_{\text{decided}} = 0.88$  and  $r_{\text{undecided}} = 0.57$ ), leading to 93.9 and 71.8 %CCC for decided and undecided voters, respectively, in case of the political camps predictors. Again, this shows that for undecided voters there was ample unexplained variance for the implicit measure to explain.

A recent study collected data during the 2012 French presidential election in which the incumbent Nicolas Sarkozy (representing the right wing) opposed François Hollande (representing the left wing; Berthet, Barthelemy, & Kop, 2015). Voting intention served as the dependent variable, and decidedness was derived from volatility; participants whose first round and second round votes 14 days later differed were classified as undecided. Political camps and political candidate IATs were significant predictors of voting intention beyond explicit indicators for decided voters ( $N = 275$ , increases in %CCC -0.1 and +0.1 percentage points), but not undecided voters ( $N = 277$ , zero %CCC changes in both cases). The IAT did not predict voting intention significantly better for either decided or undecided voters.



**Figure 1 Implicit association test (IAT) predicting better for decided as compared to undecided voters.** Probability of voting for Obama (versus McCain) as a function of IAT, decidedness, and their interaction in Friese et al. (2012, Study 1). The IAT and decidedness were assessed at time 1, voting behavior was assessed at time 2. High values indicate stronger implicit preferences for Obama (relative to McCain), and a higher probability of voting for Obama (versus McCain). The IAT predicted the dichotomous choice of vote better for decided as compared to undecided voters as indicated by the steeper line for decided as compared to undecided voters. IAT scores were z-standardized prior to the analysis. doi:10.1371/journal.pone.0044130.g001.



Finally, one study drew on the American National Election Studies (ANES) 2008–2009 Panel Study and used a representative sample of the U.S. electorate (Lundberg & Payne, 2014). In this study, decidedness was operationalized as self-reported confidence in one's just expressed voting intention. An AMP relating to the major candidates Barack Obama and John McCain predicted voting behavior descriptively but not significantly better for participants who were more confident in their voting intention (i.e., who were more 'decided'). This effect of higher predictive value for decided participants was much more pronounced and statistically significant for the explicit measure. The authors reasoned that people may take into account their explicit attitudes, but neglect their implicit attitudes when they introspect about their confidence (but see Lundberg, 2015, for conflicting evidence).

Why has no study discovered the double dissociation pattern and conceptually replicated the findings of Galdi et al. (2008)? Part of the answer may be that the study types differed in several respects. First, Galdi and colleagues asked for an unbinding opinion, whereas subsequent studies assessed voting intentions or actual (self-reported) voting behavior. Second, different degrees of cognitive elaboration of the relevant attitudes and corresponding variations in implicit–explicit consistencies may have resulted in discrepant findings (Frieze et al., 2012). Galdi et al. (2008) were concerned with a specific issue of local politics (i.e., the enlargement of a U.S. military base), whereas the subsequent studies were concerned with major political elections. Voting behavior in major political elections is strongly influenced by long-lasting party affiliations and general political attitudes that are often well elaborated. By contrast, specific issues may often be less elaborated, because, on average across issues and people, they are not as salient in the media, they rarely achieve long-lasting relevance, and they are hardly as relevant for the majority of people as the broader issues and future societal directions that people vote on in major political elections (see Frieze et al., 2012, for a discussion of this argument). As discussed previously, higher cognitive elaboration is associated with higher implicit–explicit consistency (Nosek, 2005), and the higher the overlap is the more difficult it becomes for one measure to predict incrementally over the other.

If this reasoning is correct, implicit–explicit consistency may be considerably lower for specific issues and thus leave more room for implicit measures to predict beyond explicit measures. Indeed, in the study by Galdi et al. (2008), implicit–explicit consistency was low ( $r_s < 0.20$ ) and non-significant for both decided and undecided participants.

We tested this reasoning in one study in which we used opinions toward a specific issue as the dependent variable, similar to Galdi et al. (2008). More specifically, we assessed implicitly and explicitly measured attitudes toward the erection of a manned U.S. station on the moon, and participants' opinions on this possibility (in favor, undecided, against). This topic was actually considered in the U.S. at the time of data collection (2012), but we assumed that most participants would not have thought about it intensively (Frieze, Smith, & Bluemke, 2014). As expected, implicit–explicit consistency at time 1 was much lower than for general political attitudes ( $r=0.28$  and  $r=0.02$  for decided and undecided participants, respectively) – providing perfect conditions for the implicit measure (SC-IAT) to predict the opinion about the moon station at time 2 one week later. However, the explicit measure was the stronger predictor of opinions about the moon station for both decided ( $N=346$ ) and undecided ( $N=265$ ) participants in a multiple regression analysis. The SC-IAT significantly predicted beyond explicitly measured attitudes for decided (change in  $R^2=2.1\%$ ) but not undecided participants (change in  $R^2=0.8\%$ ). Thus, even under conditions of no strong overlap between implicit and explicit measures, we failed to find evidence for the double dissociation hypothesis (Galdi et al., 2008; Gawronski & Galdi, 2011). Still, more evidence is needed to test whether the double dissociation pattern may be more likely to emerge for opinions about specific political issues rather than actual voting behavior in general elections.

*Interim summary.* To date, there is no evidence that implicit measures predict actual political voting behavior of undecided voters better than explicit measures. Similarly, there is no evidence that implicit measures predict voting behavior better for undecided than decided voters.

*Excursus: Do implicitly measured race attitudes predict voting behavior?*

In addition to attitudes toward particular candidates and parties, researchers have used implicit and explicit measures of race attitudes to predict voting behavior in the 2008 U.S. presidential election between Barack Obama and John McCain. We briefly review a subset of these studies.

In a convenience sample of 1057 voters who completed all measures in the week before the election, neither a Black-White BIAT nor an AMP predicted voting intention beyond self-reported conservatism, symbolic racism, and explicit race attitude measures (Greenwald, Smith, Sriram, Bar-Anan, & Nosek, 2009b). Using national survey data from the 2008 ANES, Finn and Glaser (2010) used party identity, political ideology, respondent race, an explicit race attitude measure and ratings of specific emotional responses toward Obama and McCain (e.g., hope, pride, fear) to predict voting for Obama versus voting for McCain. The AMP did not improve the prediction beyond this collection of self-report variables. (There were significant effects, however, in models with emotional responses excluded, suggesting some overlap between self-reported emotional responses and the AMP.)

In a comprehensive analysis of three nationally representative samples of the U.S. electorate ( $N_s=1056-1933$ ), an AMP on race attitudes remained a statistically significant predictor of voting for Obama or not beyond explicit race attitudes, demographics, and other variables known to predict voting behavior including party identification and political ideology (Payne et al., 2010). The AMP was not a significant predictor of voting for McCain or not after controlling for the other variables, however. Another analysis of a similar nationally representative sample suggested that implicit race attitudes (AMP) may have affected the odds of voting for a non-major party candidate instead of voting for Obama. Additional analyses suggested that implicit race attitudes did not affect the odds of voting for McCain, or the odds of not voting at all relative to voting for Obama (Pasek et al., 2009). In sum, the data reveal a similar picture as for the studies on specific candidate and party attitudes: At times, implicit measures did not significantly predict voting behavior; whereas sometimes they did, even beyond a host of explicit self-report and demographic variables. Evidence for changes in %CCC after adding an implicit measure to the model is not available for these studies.

## **General Discussion**

In this article, we reviewed empirical evidence for the predictive value of implicit measures of attitudes for the prediction of voting behavior beyond parallel explicit measures – overall and for decided versus undecided voters separately. In the introduction, we outlined both theoretical arguments that explained why a meaningful role in the prediction of voting behavior beyond explicit measures was unlikely and arguments that were more optimistic. The review revealed that in several studies, particularly those featuring relatively large samples, implicit measures were statistically significant predictors of voting intention and (self-reported) voting behavior both for complete samples and for decided and undecided voters separately.

Especially when working with large samples, statistical significance alone is not a good indicator of a predictor's importance and practical value, because even very small effects will become statistically significant if the sample size is large enough. From a practical point of view, the change in %CCC is very important. It indicates how many voting outcomes can be predicted (better) after adding an implicit measure to the model. In most cases we reviewed, the increase in %CCC remained well below 1 percentage point, sometimes there was no change at all, and

sometimes even descriptively a decrease in %CCC occurred. Thus, researchers need to reflect on the question of what it really means to say that “implicit measures predict voting behavior beyond explicit measures”. In terms of statistical significance, they sometimes do. In terms of practical predictive value, they appear to matter less.

Of course, there is no objective threshold that delineates meaningful from trivial contributions. Evaluating a given empirical contribution by an implicit measure is a judgment that researchers need to make in light of the specific research question, study design, and applied purpose under investigation (Greenwald, Banaji, & Nosek, 2015). Researchers should bear in mind, however, that most studies employed a rather liberal benchmark for assessing the predictive value of implicit measures. Typically, the contribution of only a single explicit indicator was compared against the implicit measure. Future studies may wish to conduct more conservative tests with additional explicit measures (e.g., voting intention, political ideology, political party affiliations, party/candidate evaluations, etc.). In some of the extant studies, including a second explicit measure, left the implicit measure statistically non-significant (e.g., Friese et al., 2012).

The available studies also revealed no evidence for the ideas that implicit measures predict the voting behavior of undecided voters (i) better than explicit measures do, or (ii) better than they predict the behavior of decided voters. In some studies, implicit measures predicted voting behavior better for *decided* than undecided voters, in other studies, they were about equally predictive for decided and undecided voters. This was true across different implicit and explicit measures, and different ways of operationalizing the concept of (un)decidedness.

Obviously, the current status of the literature does not rule out that certain configurations of implicit measures may be able to contribute more substantially to the prediction of voting behavior under certain conditions for certain individuals in the future. For example, past research has exclusively relied on evaluative associations (associations with valence categories such as positive/negative or pleasant/unpleasant). Possibly, associations with concepts like “self vs. others” or “presidential vs. not presidential” may be better able to explain additional variance. The current literature does suggest, however, that predictive value in the domain of political voting cannot be as easily obtained as was initially assumed (Arcuri et al., 2008; Friese et al., 2007). Although we are aware that the present conclusion may seem less intriguing, we believe it should be interpreted as reassuring. After all, as outlined in the introduction, sizable contributions of implicit measures for the prediction of political voting behavior would have been difficult to reconcile with a great body of theory and research.

Although the prediction of political voting behavior appears less fruitful than hoped-for, implicit measures may be able to make other important contributions to the prediction of voting behavior or political psychology more generally. For example, initial evidence suggests that the interaction of implicit and explicit attitude measures may predict whether or not a voter is undecided (Roccato & Zogmaister, 2010). Further, implicit measures may be used to predict relative vote shares for parties, coalitions, or candidates. This way, they may increase overall polling quality even if they are not able to incrementally predict individual voters’ behavior in the booth (see Roccato & Zogmaister, 2010, for an application of this approach). These and other hypotheses may receive more attention in future research.

More generally, implicit measures have also been fruitfully used to predict information processing biases in the political realm. For example, scores on a party identity IAT (Democrats versus Republicans) predicted perceptions of education and welfare policies among self-proclaimed independent voters. The more IAT scores indicated a liberal (conservative) party identity, the more likely participants were to support policies that were ostensibly proposed by the Democratic (Republican) party, regardless of the specific policy details (Hawkins & Nosek, 2012). Relatedly, in the study by Galdi et al. (2008) discussed earlier, the SC-IAT predicted changes in explicitly measured attitudes of undecided participants over one week. A subsequent

study showed that this effect was mediated by selective exposure to information that was consistent with the SC-IAT scores (Galdi, Gawronski, Arcuri, & Fries, 2012). Hence, undecided voters may expose themselves to information that is consistent with their implicitly measured attitudes. To the extent that implicitly and explicitly measured attitudes diverge, implicit measures may thus contribute to changes in explicitly measured attitudes over time, and this way ultimately also influence voting behavior. A similar mechanism of automatic processes biasing more controlled processes has been observed with spontaneous trait judgments. In a seminal contribution, Todorov and colleagues (Todorov, Mandisodza, Goren, & Hall, 2005) showed that spontaneous competence judgments of faces of political candidates predicted later election outcomes. Further analyses showed that these spontaneous “thin slice” judgments (Ambady, Bernieri, & Richeson, 2000) served as anchors for more deliberate competence judgments that may then have influenced voting behavior. For a more in-depth discussion of these and other applications of implicit measures in political psychology, see Gawronski et al. (2015).

## **Conclusion**

Implicit measures have made important contributions to various fields of psychological science including political psychology. Theoretical analyses suggested that political voting was a realm where implicit measures would have little incremental value. In contrast to this pessimistic expectation, initial findings suggested great relevance of implicit measures. However, subsequent difficulties in replicating and generalizing those early findings and the consideration of effect sizes alongside statistical significance have again changed the picture. In a sense, researchers have moved the fence back to near where it was. It is our hope that this review will spur researchers in implicit social cognition to use their considerable ingenuity in again pushing the boundaries of what implicit measures can predict.

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